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EXAMINER

GEBREYESUS, YOSEF

ART UNIT

PAPER NUMBER

2811

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/534,956

## Applicant(s)

KOHL ET AL.

## Examiner

YOSEF GEBREYESUS

## Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-51 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1-9, 13 and 51 are rejected under 35 U.S.C. 102(a) as being anticipated by Partridge et al. (US 2004/0245586, dated December 9<sup>th</sup>, 2004, filed June 4<sup>th</sup>, 2003).

Regarding **claim 1**, figure 2, 3 & 12 of Partridge et al. discloses a micro electro-mechanical device 20a-20d (paragraph [0043]) formed on a substrate layer 14; and a protective structure (encapsulating layer) 28a, 28b and 28c (paragraph [0046]) that is positioned on a portion of the substrate layer 14, the protecting structure 28a, 28b and 28c being a distinct structure from the substrate layer, said protective structure 28a, 28b and 28c protecting at least a portion of the micro electro-mechanical device 20a-20d, where in the protective structure 28a, 28b and 28c surrounds at least a portion of a gas cavity (chamber) (paragraph [0049]) enclosing an active surface of the micro electro-mechanical device 20a-20d.

FIGURE 3

Regarding **claim 2**, figures 2, 3 and 12 of Partidge et al. disclose the substrate layer 14 comprises silicon material (paragraph [0002]).

Regarding **claim 3**, figures 2, 3 and 12 of Partidge et al. disclose the substrate layer 14 comprises non-silicon material (gallium arsenide) (paragraph [0045]).

Regarding **claim 4**, figures 2, 3 and 12 of Partridge et al. discloses the protective structure 28a , 28b and 28c comprises a metal material (layer 28c comprises metal) (paragraph [0092]).

Regarding to **claim 5**, the limitation “is deposited by sputtering” is merely product-by-process limitation that does not structurally distinguish the claimed invention over the prior art. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966.

Regarding **claim 6**, figures 2, 3 and 12 of Partridge et al. discloses wherein the protective structure 28a, 28b and 28c comprises an overcoat polymer material (layer 28 b) (paragraph [0093]).

Regarding **claim 7**, the limitation "is deposited by spin-coating" is merely product-by-process limitation that does not structurally distinguish the claimed invention over the prior art. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966.

Regarding **claim 8**, figures 2, 3 and 12 of Partridge et al. disclose an additional structure surrounding the overcoat polymer material (layer 28c) (paragraph [0093]).

Regarding **claim 9**, figures 2, 3 and 12 of Partridge et al. disclose wherein the additional protective structure comprises a metal material (metal bearing material) (paragraph [0093]).

Regarding **claim 13**, figures 2,3 and 12 of Partridge et al. discloses wherein protective structure has not been preformed before being applied to the substrate layer (encapsulation layer is deposited on the substrate by LPCVD) (paragraph [0048]).

Regarding **claim 51**, figures 1a-c of Partridge et al. discloses wherein said protective structure 75 is solid (metal) (paragraph [0050]).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 10-12, 15-20, 24-37, 40-42 and 46 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Partridge et al. in view of Barth et al. (2006/0014374).

Regarding **claims 10-12**, figures 2, 3, 11 A-D and 12 (one embodiment) of Partridge et al. discloses wherein the protective structure 28a, 28b and 28c comprises a modular polymer that includes the characteristic of being permeable (paragraph [0034]).

Partridge et al. does not specifically disclose the decomposition gases produced by the decomposition of a sacrificial polymer while forming the gas cavity.

However, in the same field of endeavor Barth et al. discloses in a semiconductor process, a silicon wafer 100 where in the protective structure (covering layer) 124 comprises a modular polymer that includes the characteristic of being permeable (paragraph [0062]) to the decomposition gases produced by the decomposition of sacrificial polymer 112 while forming the gas cavity 128 (paragraph [0062]) lines 6-7) substantially free of residue (paragraph [0020] lines 17-20) and vacuum packed (paragraph [0028] lines 1-5).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the device of Partridge et al. with the teachings of Barth et al. to form a protective modular polymer that is permeable to the decomposition of a sacrificial polymer while forming the gas cavity substantially free of residue and vacuum packed in order to reduce processing steps and forming residue free structure.

Regarding **claim 15, 16 and 18**, figures 2, 3 11A-D and 12 of Partridge et al. discloses a micro electro-mechanical device 12 formed on a substrate layer; and a gas cavity (chamber).

Partridge et al. does not disclose thermally decomposable photo definable polycarbonate material sacrificial structure formed in to a cavity enclosing an active surface.

However, in the same field of endeavor figure 1f of Barth et al. teaches a thermally decomposable sacrificial structure 112, where in the sacrificial structure is formed into gas cavity where the sacrificial structure comprises photo-definable polycarbonate (paragraph [0030] and [0031]) material.

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Partridge et al's device with the teachings of Barth et al. by forming a photo-definable polycarbonate thermally decomposable sacrificial structure protecting at least the portion of micro electro-mechanical device, wherein the sacrificial structure is formed into a gas cavity enclosing an active surface for the purpose of reducing process step and forming residue free cavity.

Regarding **claim 17**, the limitation "is deposited by spin-coating followed by patterning" is merely product-by-process limitation that does not structurally distinguish the claimed invention over the prior art. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966.

Regarding **claim 19**, the limitation is "dispensed by a syringe dispensing tool" is merely product-by-process limitation that does not structurally distinguish the claimed invention over the prior art. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. *In re Thorpe*, 227 USPQ 964, 966

Regarding **claim 20**, figures 2, 3, 11A-D and 12 of Partridge et al. discloses wherein the sacrificial structure comprises a non-photo-definable material (silicon dioxide) (paragraph [0058]).

Regarding **claim 24**, figures 2, 3, 11A-D and 12 of Partridge et al. discloses forming a protective layer 28A, 28B and 2C (col. 4 lines 35-40), gas cavity (chamber).

Partridge et al. does not disclose forming thermally decomposable sacrificial layer on a substrate where in decomposed molecules of the sacrificial layer permeates through the protective layer forming a gas cavity.

However, in the same field of endeavor figure 1E of Barth et al. discloses forming a thermally decomposable sacrificial layer 112 on a substrate 100, forming thermally



decomposing the sacrificial layer (paragraph [0040]), wherein decomposed molecules of the sacrificial layer permeate through the protective layer, and where in a gas cavity 128 is formed where thermally decomposable sacrificial layer was formed (paragraph [0062] lines1-3).

Therefore in view of such teachings it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. with the teachings of Barth et al. to form a gas cavity using thermally decomposing sacrificial layer for the purpose of forming residue free cavity.

Regarding **claim 25**, Partridge et al. substantially discloses the claimed invention except the method of depositing sacrificial layer.

However, in the same field of endeavor, figure 1B of Barth et al. teaches applying a solution in a silicon wafer 100 to form a layer 102 by using a spin coating technique (Paragraph [0056]).

Therefore in view of such teachings it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. with the teachings of Barth et al. to form a sacrificial layer by using a spin coating method for the purpose depositing uniform sacrificial layer.

Regarding **claim 26**, Partridge et al. substantially teaches the claimed inventions except the sacrificial layer has a decomposition temperature less than a decomposition temperature of the substrate and a decomposition of the protective layer.

However, in the same field of endeavor, Barth et al. teaches the sacrificial layer has a decomposition temperature less than a decomposition temperature of the

substrate (cavity) (paragraph [0062]) and a decomposition temperature of the protective layer (cover layer) (paragraph [0026]).

Therefore in view of such teachings it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. with the teachings of Barth et al. to form a sacrificial layer which has a decomposition temperature less than the decomposition temperature of the substrate and protective layer for the purpose of making cavity without damaging the protective layer and the substrate.

Regarding **claim 27**, figures 2, 3, 11A-D and 12 of Partridge et al. disclose the substrate layer 14 comprises silicon material (paragraph [0002]).

Regarding **claim 28**, figures 2, 3, 11A-D and 12 of Partridge et al. disclose the substrate layer 14 comprises non-silicon material (gallium arsenide) (paragraph [0045]).

Regarding **claim 29**, figures 2, 3, 11A-D and 12 of Partridge et al. disclose wherein the thickness of the protective layer is within the range of 50 nm and 500 .mu.m (layer 28a is 5um and layer 28b is 5 um) (paragraph [0054] and [0064]).

Regarding **claim 30**, figures 2, 3, 11A-D and 12 of Partridge et al teaches the protective layer (encapsulation layer) has not been perforated (sealed) (paragraph [0010]).

Regarding **claim 31**, figure 2, 3, 11A-D and 12 of Partridge et al. teaches the protective layer is porous (permeable) (paragraph [0034]); therefore the protective layer is considered substantially free of sacrificial material.

Regarding **claim 32**, Figure 1c Partridge et al. teaches the protective layer provides an air tight (seal) enclosure around the gas cavity (chamber) (paragraph [0046]).

Regarding **claim 33**, figures 2, 3 a11A-D and 11 of Partridge et al. wherein the protective layer provides protection from mechanical forces (paragraph [0049]).

Regarding **claim 34**, the limitation “the protective layer further provides protection against water” is merely a functional/intended use limitation that does not structurally distinguish the claimed invention over the prior art. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-31 (Fed. Cir. 1997).

Regarding **claim 35**, the limitation “the protective layer further provides protection against oxygen gas” is merely a functional/intended use limitation that does not structurally distinguish the claimed invention over the prior art. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-31 (Fed. Cir. 1997).

Regarding **claim 36**, the limitation “the protective layer further provides protection against exposure to gaseous materials” is merely a functional/intended use limitation that does not structurally distinguish the claimed invention over the prior art. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure

than function. *In re Schreiber*, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429,1431-31 (Fed. Cir. 1997).

Regarding **claim 37**, figures 2, 3, 4, 11A-D and 12 of Partridge et al. discloses wherein the micro electro-mechanical device includes a released mechanical structure before the sacrificial material is formed (paragraph [0060]).

Regarding **claim 40-41**, figures 2, 3, 4, 11A-D and 12 of Partridge et al. discloses forming a forming a barrier layer around the protective layer, the barrier layer (metal layer) providing a stronger protection against mechanical forces than the protective layer (paragraph [0049] and [0092]).

Regarding **claims 42**, figures 2, 3, 4, 11A-D and 12 of Partridge et al. discloses creating a vacuum inside the gas cavity by heating the micro electro-mechanical device in a chamber; and after the vacuum is created, forming a barrier layer around the protective layer within the chamber to provide a vacuum-packed enclosure around the gas cavity, the barrier layer comprising a metal material (paragraph [0091] and [0092]).

Regarding **claim 46**, figures 2, 3, 4, 11A-D and 12 of Partridge et al. substantially discloses the claimed invention except the method of thermally decomposing the sacrificial layer inside the vacuum chamber.

However, in the same field of endeavor, figure 1E of Barth et al discloses the method of decomposing the sacrificial layer 112 (paragraph [0062]) inside the vacuum chamber (paragraph [0028]).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. with the teachings of

Barth et al. to thermally decompose the sacrificial layer inside vacuum chamber for the purpose of forming particle free cavity.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Partridge et al. as applied to claim 13 in view of Silverbrook (US 2003/0122227, dated July 3<sup>rd</sup>, 2003, filed January 8<sup>th</sup>, 2002).

Regarding **claim 14**, figures 2, 3, 11A-D and 12 of Partridge et al. substantially discloses the claimed invention except a metal packaging frame, the micro electro-mechanical device being attached to the metal packaging frame; and a coating material encapsulating a portion of the micro electro-mechanical device and metal packaging frame assembly.

However, in the same field of endeavor, figure 23 of Silverbrook discloses a metal packaging frame, the micro electro-mechanical device 206 being attached to the metal packaging frame (copper lead frame); and a coating material (epoxy) 218 encapsulating a portion of the micro electro-mechanical device and metal packaging frame assembly (paragraph [0068] and [0069]).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify Partridge et al's device. with the teachings of Dunn et al. by forming a metal packaging frame attached to micro electro-mechanical device and a coating material encapsulating a portion of the micro electro-mechanical device and metal packaging frame assembly for the propose of forming robust hermetic seal frame and to protect the MEMS device.

Claims 21-23 ,38-39,43-45,47-49, and 50 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Partridge et al. in view of Barth et al. and further in view of Silverbrook.

Regarding **claims 21 and 22**, figures 2, 3, 11A-D and 12 of Partridge et al. substantially discloses the claimed invention except a metal packaging frame, a coating material comprising an epoxy resin encapsulating a portion of micro electro-mechanical device and metal packaging assembly, the coating material being permeable to the decomposition of gases produced by the decomposition of sacrificial polymer at a temperature exceeding a curing temperature of the coating material.

However, in the same field of endeavor Barth et al. discloses a coating material (polybenzoxazole) 124 (paragraph [0062] including the characteristics of being permeable of a sacrificial polymer 112 and a thermally decomposition gases produced by the decomposition of sacrificial polymer.

Moreover, in the same field of endeavor figure 23 of Silverbrook discloses a metal packaging frame 252, the micro electro-mechanical device 206 being attached to the metal packaging frame (copper lead frame); and a coating material (epoxy) 218 encapsulating a portion of the micro electro-mechanical device and metal packaging frame assembly (paragraph [0068] and [0069]).

The limitation, the decomposition the coating material including the characteristic of being permeable to the decomposition gases produced by the decomposition of a sacrificial polymer at a temperature exceeding a curing temperature of the coating

material is inherent material property and should be satisfied by using the same material as claimed.

Therefore, in view of such teachings it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the f Partridge et al.'s device with the teachings of Barth et al., Yao et al. and Silverbrook. by forming a micro electro-mechanical device being attached to the metal packaging frame, an epoxy coating material encapsulating the micro electro-mechanical device and metal packaging frame, a coating material being permeable to the decomposition of sacrificial polymer for the purpose of making residue free cavity with a robust packaging.

Regarding **claim 23**, figures 2, 3, 11A-D and 12 of Partridge et al. an overcoat structure 28a surrounding the sacrificial structure 32, the overcoat structure comprising a modular polymer that includes the characteristic of being permeable (paragraph [0034]).

Partridge et al. does not disclose the decomposition gases produced by the decomposition of a sacrificial polymer from inside the gas cavity.

However, in the same field of endeavor Barth et al. discloses a decomposition of gases produced by the decomposition of sacrificial polymer 112 from inside the gas cavity (paragraph [0050]).

Therefore it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the Partridge et al.'s device with the teachings of Barth et al. to form a gas cavity by decomposing a sacrificial polymer for the purpose of forming residue free gas cavity.

Regarding **claim 38**, figures 2, 3, 4, 11A-D and 12 of Partridge et al. substantially discloses the claimed invention except before the protective layer is formed, attaching the micro electro-mechanical device to a metal packaging frame, wherein the protective layer comprises an epoxy resin encapsulating the micro electro-mechanical device and metal packaging frame assembly.

However, in the same field of endeavor, Silverbrook discloses the chip is attached to the metal packaging frame (copper lead frame) 216 before the protective layer 218 is formed in order to form electrical connection to the device.

Regarding **claim 39**, figures 2, 3 4, 11A-D and 12 of Partridge et al. substantially discloses the claimed invention except heating the micro assembly at a temperature for curing the protective layer and for decomposing the sacrificial layer exceeding the temperature for curing protective layer.

However, in the same field of endeavor Barth et al. teaches the sacrificial layer has a decomposition temperature less than the decomposition temperature of the protective layer (cover layer) (paragraph [0026]).

Therefore in view of such teachings it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. with the teachings of Barth et al. by using a sacrificial layer which has a decomposition temperature exceeding the curing temperature of the protective layer for the purpose of making curing the protective layer and decomposing the sacrificial layer simultaneously.



Regarding **claim 43-45**, Partridge et al. and Barth et al substantially discloses the claimed inventions except after barrier layer is formed attaching the micro electro-mechanical device to an integrated circuit package structure; and encapsulating the device and integrated circuit package comprising lead frame and ceramic package in a protective coating.

However, in the same field of endeavor figure 23 of Silverbrook discloses attaching the micro-electro-mechanical device to an integrated circuit package structure 216 (lead frame) (paragraph [0069]); and encapsulating (paragraph [0069]) the electro-mechanical device and integrated circuit package structure comprising ceramic package (paragraph [0002]).

Therefore in view of such teachings it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. , Barth et al. with the teachings of Silverbrook to attach the micro electro-mechanical device to an integrated package structure comprising lead frame and ceramic package for the purpose of forming electrical connectivity between the MEMS device and external power supplies and signals and to provide additional mechanical and environmental protection.

Regarding **claim 47-49**, figures 2, 3, 4, 11A-D and 12 of Partridge et al. substantially discloses the claimed invention except after the sacrificial layer is decomposed, attaching the micro electro-mechanical device to an integrated circuit package structure (lead frame) which comprises ceramic and encapsulating the device and package structure in a protective coating.

However, in the same field of endeavor Barth et al. teaches decomposing the sacrificial layer.

Further, Silverbrook discloses attaching the micro-electro-mechanical device to an integrated circuit package structure 216 (lead frame) (paragraph [0069]); and encapsulating (paragraph [0069] the electro-mechanical device and integrated circuit package structure comprising ceramic package (paragraph [0002]) in a protective coating (epoxy).

Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to modify the teachings of Partridge et al. with the teachings of Barth et al. and Silverbrook in which after the sacrificial layer is decomposed attaching the micro electro-mechanical device to an integrated circuit package structure and encapsulating the device and package structure in a protective coating for the purpose of forming a cavity free or residue prior to sealing the MEMS device.

Regarding **claim 50**, Partridge et al. and Barth et al. substantially discloses the claimed invention except wherein thermal decomposition temperature of the sacrificial material is less than 100 degrees Celsius.

Parameters such as thermal decomposition temperature of the sacrificial material is inherent material property, moreover, there is no evidence that indicates the thermal decomposition temperature of the sacrificial layer to be less than 100 degrees Celsius is critical and it has been held that it is not inventive to discover the optimum workable temperature of a result-effective variable with given prior art conditions by routine

experimentation. See MPEP 2144.05 Note that the specification contains no disclosure the critical nature the claimed height of any unexpected results there from.

### ***Response to Amendment***

Applicant's amendment filed on May 26<sup>th</sup>, 2009, overcame the objections to the specification and the drawings. The objections to the specification and drawings have been withdrawn.

Claim 1 as amended by the amendment and claims 2-50 as previously recited are currently in the application, presently newly added claim 51.

Applicant's arguments with respect to claim 1 have been considered but are not persuasive in view of the new ground(s) of rejection.

The examiner would like to emphasize the new ground(s) of rejection is established because Applicant has added a new limitation "the protective structure that is positioned on a portion of the substrate layer, the protective structure being a distinct structure from the substrate layer" in claim 1.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOSEF GEBREYESUS whose telephone number is (571)270-5765. The examiner can normally be reached on Monday through Thursday 7:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lynne A. Gurley/  
Supervisory Patent Examiner, Art Unit 2811

Yosef Gebreyesus  
08/14/2009

/Y. G. /  
Examiner, Art Unit 2811